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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/738,469 | 12/17/2003 | Bernhard W. Borschert | K-2104 | 8203 |
| 27877 | 7590 | 11/03/2005 | EXAMINER | |
| KENNAMETAL INC. P.O. BOX 231 1600 TECHNOLOGY WAY LATROBE, PA 15650 | | | TALBOT, MICHAEL | |
| | | ART UNIT | | PAPER NUMBER |
| | | | | 3722 |

DATE MAILED: 11/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/738,469 | BORSCHERT ET AL. | |
| | Examiner Michael W. Talbot | Art Unit 3722 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 05 October 2005.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-13 and 16-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-13 and 16-22 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 17 December 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application (PTO-152)
6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,2,5-13 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cselle '034 in view of Ebenhoch et al. '740. Cselle '034 shows in Figures 1,1A,1B,6,6A,7 and 7A a twist drill (110,210,310) having a cutting tip including a front flank face (124,224,324), a substantially cylindrical steel or cemented carbide (col. 4, lines 9-13) tool body (114,214,314) extending rearward from the cutting tip, a shank (112,212,312), a rotational axis (about direction of rotation) and at least one flute (116,216,316) with at least one coolant hole (122,222,322) formed on the periphery surface and extending from the front flank surface. Cselle '034 further shows in Figures 6 and 6A the flute having a first positive helical portion (inside portion 240) between 0° and 50° (col. 1, lines 13-18) and a second helical portion twisting in a direction opposite of the first helical portion (col. 4, lines 9-22 and col. 5, lines 21-35) between -1° and -10° (col. 3, lines 16-24). Cselle '034 further shows a third helical portion, equal to the helix angle of the second portion, extending from the rear of the second helical portion

Cselle '034 lacks the third helical portion having a twist in an opposite direction of the second helical portion. Ebenhoch et al. '740 shows in Figure 2 a flute having three distinct portions (I,II,III) with the third portion (III) twisting in an opposite direction of the second portion (II) at a 0° helix angle (aligned with tool axis) and the second twisted portion capable of being subdivided into segments with a differing helical angle (col. 3, lines 26-35). In view of this

teaching of Ebenhoch et al. '740, it is considered to have been obvious to add a third portion twisting in an opposite direction of the second portion of Ebenhoch et al. '740 to the twist drill of Cselle '034 to provide a much improved chip evacuation channel and a greater tool body stiffness to counter elastic bending deformation.

Regarding claim 19, Ebenhoch et al. '740 does not disclose expressly that the helix angle of the third helical portion is 5°. Instead, Ebenhoch et al. '740 indicates that the helix angle is 0°. At the time of the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to select a helix angle for the third helical portion to be 5°. One of ordinary skill in the art, furthermore, would have expected the twist drill of Ebenhoch et al. '740, and Applicant's twist drill to perform equally well with either the helix angle 0° taught by Ebenhoch et al. '740 or the claimed helix angle of 5° because both angles would perform the cutting, chip removal and drill tool stabilization functions.

Furthermore, Applicant does not provide any criticality or unexpected results for the helix angle of the third portion being 5° as recited in claim 19.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cselle '034 in view of Ebenhoch et al. '740, further in view of McCormick '164. Cselle '034 in view of Ebenhoch et al. '740 lack the twist drill having an interchangeable cutting tip. McCormick '617 shows in Figure 1 a twist drill (10) having a removable cutting tip (16). In view of this teaching of McCormick '164, it would have been obvious to one of ordinary skill in the art to add the interchangeable cutting tip feature of McCormick '164 to the twist drill of Cselle '034 in view of Ebenhoch et al. '740 to provide a stronger, more wear resistant tip to meet the higher stress concentration with a tool shank made from lesser materials and to improve ease of replacement of cutting bit.

4. Claims 4-8,10,11 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaconi '674, further in view of Cselle '034 in view of Ebenhoch et al. '740. Jaconi '674 shows in Figures 1-3 a twist drill (10) having a S-shaped cutting tip (60) including a front flank face (31), a substantially cylindrical steel or cemented carbide (col. 5, lines 16-22) tool body (18) extending rearward from the cutting tip, a shank (14), a rotational axis (L) and a pair of flutes (22,24) formed on the periphery surface and extending from the front flank surface. Jaconi '674 further shows a web thickness depending upon the overall diameter of the drill (i.e. shank plus body, col. 4, lines 57-61) that can remain constant, be tapered or simple vary in diameter (col. 3, line 61 through col. 4, line 9). Jaconi '674 further shows the flutes having a constant positive helical shape with a helix angle ranging from about 10° to about 40°, more specifically about 20° to 30°.

Jaconi '674 lacks a second helical portion twisting in a direction opposite of the first helical portion. Cselle '034 shows in Figures 1,1A,1B,6,6A,7 and 7A a first helical portion (inside portion 240) between 0° and 50° (col. 1, lines 13-18) and a second helical portion twisting in a direction opposite of the first helical portion. In view of this teaching of Cselle '034, it would have been obvious to one of ordinary skill in the art to replace the single direction helical configuration of Jaconi '674 with another well-known multi-direction helical configuration consisting of a first helix portion followed by a second helical portion twisting in a direction opposite of Cselle '034 to stabilize the drill bit against lateral forces (smoother drilling) with much less vibration.

Jaconi '674 lacks a third helical portion having a twist in an opposite direction of the second helical portion. Ebenhoch et al. '740 shows in Figure 2 a flute having three distinct portions (I,II,III) with the third portion (III) twisting in an opposite direction of the second portion (II) at a 0° helix angle (aligned with tool axis) and the second twisted portion capable of being

subdivided into segments with a differing helical angle (col. 3, lines 26-35). In view of this teaching of Ebenhoch et al. '740, it would have been obvious to one of ordinary skill in the art to add a third portion twisting in an opposite direction of the second portion of Ebenhoch et al. '740 to the twist drill of Jaconi '674 in view of Cselle '034 to provide a much improved chip evacuation channel and a greater tool body stiffness to counter elastic bending deformation.

5. Claims 3,4,7-9 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muhlfriedel et al. 2003/0175086, further in view of Cselle '034 in view of Ebenhoch et al. '740. Muhlfriedel et al. 2003/0175086 shows in Figures 2,3B,3D,3F,10 and 15 a twist drill (2) having a S-shaped cutting tip (6) including a front flank face (8), a cylindrical tool body (46) extending rearward from the cutting tip, a shank (44), a rotational axis (L), a pair of flutes (10) formed on the periphery surface and extending from the front flank surface and coolant bores (9). Muhlfriedel et al. 2003/0175086 further shows a constant or tapered web diameter (K) over the longitudinal direction (L) of the drill (col. 6, last three lines of paragraph [0062]). Muhlfriedel et al. 2003/0175086 further shows the flutes having a constant positive helical shape and that the cutting tip can be interchangeable (page 4, paragraph [0029]).

Muhlfriedel et al. 2003/0175086 lacks a second helical portion twisting in a direction opposite of the first helical portion. Cselle '034 shows in Figures 1,1A,1B,6,6A,7 and 7A a first helical portion (inside portion 240) between 0° and 50° (col. 1, lines 13-18) and a second helical portion twisting in a direction opposite of the first helical portion. In view of this teaching of Cselle '034, it would have been obvious to one of ordinary skill in the art to replace the single direction helical configuration of Muhlfriedel et al. 2003/0175086 with another well-known multi-direction helical configuration consisting of a first helix portion followed by a second helical portion twisting in a direction opposite of Muhlfriedel et al. 2003/0175086 to stabilize the drill bit against lateral forces (smoother drilling) with much less vibration.

Muhlfriedel et al. 2003/0175086 lacks a third helical portion having a twist in an opposite direction of the second helical portion. Ebenhoch et al. '740 shows in Figure 2 a flute having three distinct portions (I,II,III) with the third portion (III) twisting in an opposite direction of the second portion (II) at a 0° helix angle (aligned with tool axis) and the second twisted portion capable of being subdivided into segments with a differing helical angle (col. 3, lines 26-35). In view of this teaching of Ebenhoch et al. '740, it would have been obvious to one of ordinary skill in the art to add a third portion twisting in an opposite direction of the second portion of Ebenhoch et al. '740 to the twist drill of Muhlfriedel et al. 2003/0175086 in view of Cselle '034 to provide a much improved chip evacuation channel and a greater tool body stiffness to counter elastic bending deformation.

Response to Arguments

6. Applicant's arguments filed 05 October 2005 have been fully considered but they are not persuasive.

The indicated allowability of claims 15-19 referenced in the 25 August 2005 Office Action is withdrawn since these claims were rejected under 35 U.S.C. 103(a) over Cselle '034 in view of Ebenhoch et al. '740 (page 3). In addition, the Index of Claims and the Office Action Summary (PTOL-326) both indicated these claims as being rejected.

Eventhough the subject matter of claims 14 and 15 have been rewritten into independent format (i.e. inserted into independent claim 1), this does not overcome the above outlined rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 3722

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning the content of this communication from the examiner should be directed to Michael W. Talbot, whose telephone number is 571-272-4481. The examiner's office hours are typically 8:30am until 5:00pm, Monday through Friday. The examiner's supervisor, Mr. Boyer D. Ashley, may be reached at 571-272-4502.

In order to reduce pendency and avoid potential delays, group 3720 is encouraging FAXing of responses to Office Actions directly into the Group at FAX number 571-273-8300. This practice may be used for filling papers not requiring a fee. It may also be used for filling papers, which require a fee, by applicants who authorize charges to a USPTO deposit account. Please identify Examiner Michael W. Talbot of Art Unit 3722 at the top of your cover sheet.


Michael W. Talbot
Examiner
Art Unit 3722
21 October 2005


BOYER D. ASHLEY
PRIMARY EXAMINER